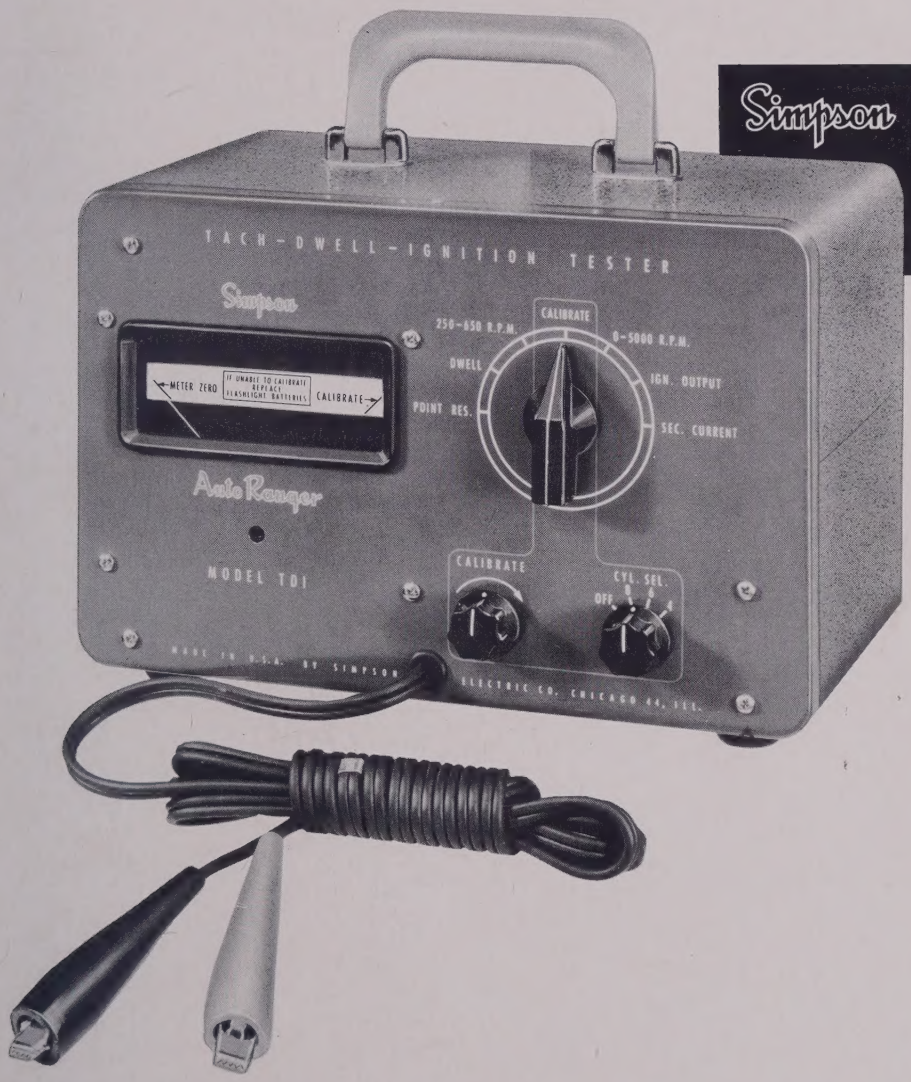
INSTRUCTION MANUAL

TACH-DWELL IGNITION TESTER



SIMPSON ELECTRIC COMPANY

AUTOMOTIVE DIVISION

5200 W. Kinzie St., Chicago 44, Illinois, EStebrook 9-1121

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Price $1.50

SIMPSON MODEL TDI TACH-DWELL-IGNITION TESTER

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SERVICE PARTS AND ACCESSORIES

(Available at all Simpson repair stations)

PART NO.	DESCRIPTION
10–837542	Jumper Lead Assembly
1–117872	Insulated Pliers
10–837543	Test Lead Assembly
1–117801	Relay, Millisec, Stevens Arnold part no. 173
1–117802	Lamp, Ballast, 14.4 volt, type 53
3–260143	Knob, Test Selector
1–115546	Knob, Cylinder Selector
1–117660	Knob, Calibrate Control

MODEL TDI TACH-DWELL-IGNITION TESTER

FEATURES SIMPLICITY

- MULTI–TESTER versatility with SINGLE test SIMPLICITY.
- AUTO RANGER meter for AUTOMATIC scale selection.
- ONE pair of leads and ONE calibrate position for ALL tests.
- LARGE numerals and divisions for easy to read SCALE.
- Test interpretation using GOOD and BAD bands whenever possible.

FEATURES VERSATILITY

- EXCLUSIVE engine running POINT RESISTANCE test in addition to the conventional point resistance test with the engine stopped.
- DUO-DWELL scale for more ACCURATE dwell readings on all engines including ALL 4 cylinder European cars which are so popular to-day.
- A unique 250–650 RPM EXPANDED scale tachometer eliminates the need of a vacuum gauge for carburetor idle mixture adjustment.
- Popular 0–5000 RPM tach scale with 1500 rpm division outlined in RED for easy viewing.
- Ignition Output Test includes ignition MISS detection feature. NO EXTRA calibration required for various engines.
- Secondary Current Test features a GOOD and BAD band for all engines.

BONUS FEATURES

- LONG test leads to facilitate application of the equipment for road testing or use from a test stand.
- Designed for all 6 & 12 volt ignition systems. No additional switching necessary.
- Uses any type SIZE D batteries including MERCURY cells.
- Sharon Art steel case looks NEW longer. Camouflages shop wear and scratches, Wipes clean.
- Handy BRACKET on back of tester for neat lead storage.

The AUTO RANGER meter has made possible the combining of all these features into ONE tester. Each test position makes it a different tester, but the single pair of leads, single calibration, single scale selection, gives it SINGLE test SIMPLICITY. The large separate scales are the answer for EASY long-distance viewing and simplified interpretation.

The tester is designed for all 4, 6 and 8 cylinder engines having either 6 or 12 volt ignition systems. The only power required for operation of the unit are two size D batteries on the inside of the tester and accessible through a special panel on the back of the tester. With the exception of the Secondary Current all tests are made by a simple connection to the ignition primary circuit.

The 250–650 rpm EXPANDED scale tachometer represents only 400 rpm change, more than DOUBLE the SENSITIVITY of conventional low rpm tachometers. Each division equals 10 rpm providing adequate meter indication for use in precision idle mixture adjustments of all carburetors; single, dual, four-bore, four-bore with both air and mixture screws and compound installations. With one quick, simple hook-up even the beginner can perform satisfactory carburetor adjustments.

The inherent ACCURACY and READABILITY of this tachometer is more than twice that of the conventional low scale tachometers. Low engine idle speeds and automatic transmissions necessitate this improved accuracy.

The HIGH range tach has a 0–5000 rpm scale. Each division equals 100 rpm. This range is best suited to cover the wide range of applications for both load and no-load testing of the many different engines. The portability of the unit makes it desirable for both in the shop and road testing.

The DUO–DWELL scale provides a means of reading dwell on all 4 cylinder engines without sacrificing the accuracy required for 6 and 8 cylinder engines where dwell is more critical. The 0–50 degree scale is used for 6 and 8 cylinder engines and the 30–70 degree scale is used for 4 cylinder engines. Both scales provide adequate range for all ACTUAL dwell specifications. Limiting the scales to 50 and 70 degrees provides large divisions for making easy and accurate readings.

This dwell circuit gives a TRUE indication of the mechanical condition of the distributor and point spacing. Abnormal PRIMARY RESISTANCE (dirty points, bad wiring, loose connections etc.) or SECONDARY LOAD (excessive plug gap, corroded terminals, broken high tension wires etc.) does not influence the dwell reading in SIMPSON DWELL–TACH testers. The circuit is designed to give accurate dwell readings at all speeds, even for dwell adjustment at cranking speeds.

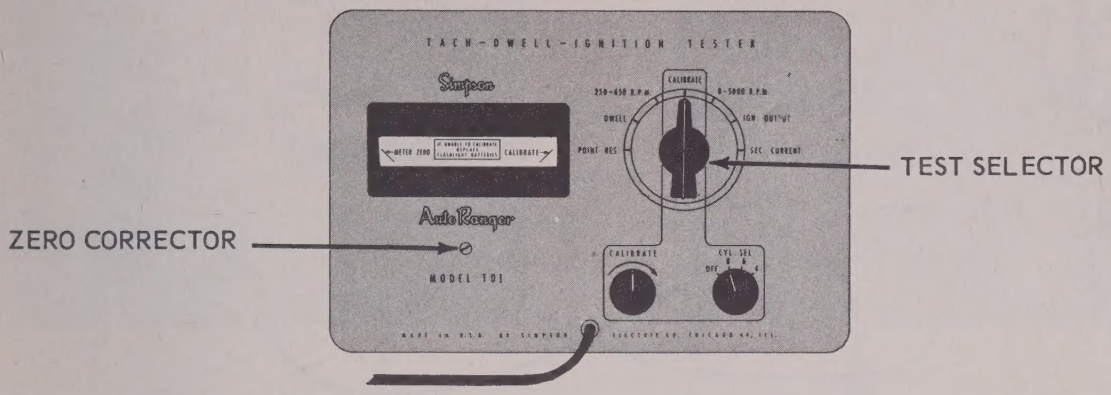
The POINT RESISTANCE test is performed either with the engine running or stopped. Constant or intermittent changes in resistance during operation of the points at engine speeds ranging from idle to 2500 rpm is indicated on a GOOD and BAD scale. The dynamic point resistance test can be performed in a fraction of the time required for static tests. In addition to being a big time saver, it has the advantage of testing point condition under actual operation. Engine stopped tests are recommended for pin-pointing abnormal resistance. Also when installing new parts, point resistance should be measured to assure good contact and proper cleaning.

The test leads are connected across the ignition points during the Ignition Output test. No lead changing or additional calibration is required for the various engines or electrical systems. An added feature of the Output test is a means of detecting ignition MISS caused by the absense of a secondary spark. The ignition miss test is performed under ignition load by momentary acceleration of the engine from idle to wide-open throttle. Ignition failure will be indicated by an up-scale reading of the meter.

Another important feature is the FLEXIBILITY of the tester to the use of various types of batteries. Any two or combination of the following batteries can be used. All makes of standard size D flashlight cells; energizer cells; and Mercury cells.

The calibration control corrects for variations in battery voltage and indicates the need for battery replacement. This feature assures accuracy of the tester throughout the entire useful life of the batteries even when MERCURY cells are used.

CALIBRATION FOR ALL TESTS

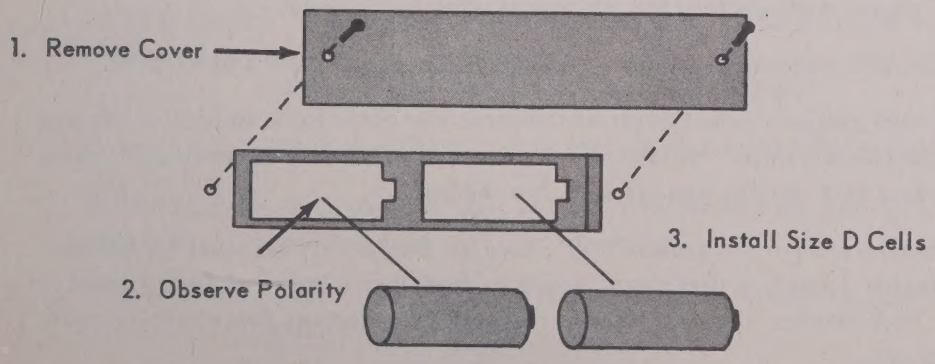


1. Turn TEST SELECTOR to the CALIBRATE position.
2. Adjust ZERO CORRECTOR right or left until the meter pointer is on the METER ZERO line.
3. Turn CYLINDER SELECTOR switch to;
   8 for 8 cylinder engines.
   6 for 6 cylinder engines.
   4 for 4 cylinder engines.
4. Adjust CALIBRATE CONTROL until meter reads on the CALIBRATE line. NOTE: If unable to adjust the meter to the calibrate line REPLACE BATTERIES. See below.

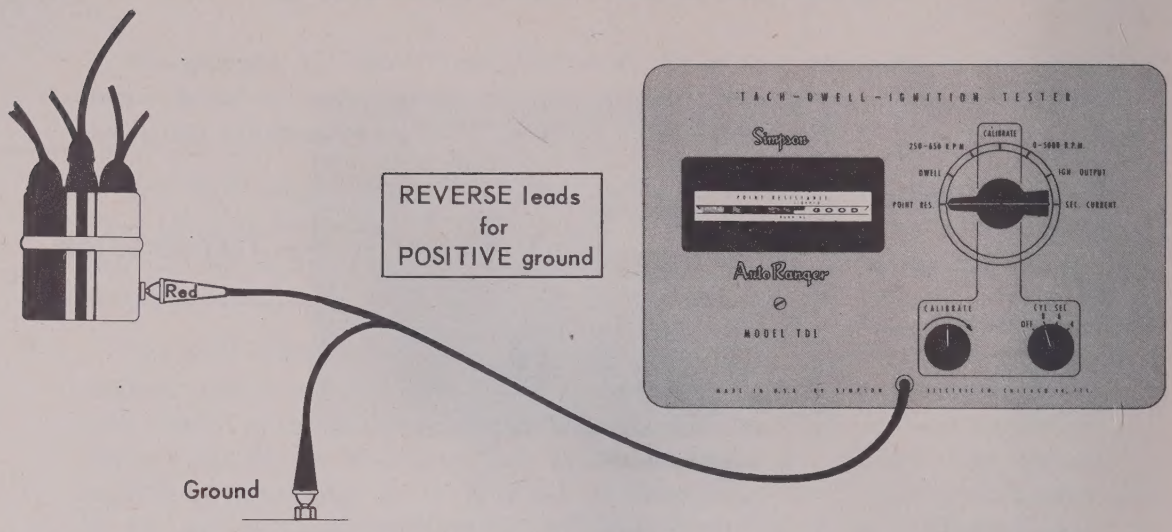
   IMPORTANT: This is the ONLY calibration required for all test positions and should not be disturbed.

BATTERY REPLACEMENT

1. Remove two screws holding battery access panel on back of tester.
2. REPLACE with any TWO or COMBINATION of the following.
   Size D flashlight cell
   Size D Energizer cell
   Size D Mercury cell.



POINT RESISTANCE TESTS



POINT RESISTANCE (ENGINE RUNNING)

1. ZERO meter and CALIBRATE tester as outlined on Page 3.
2. Connect test leads to DISTRIBUTOR primary terminal and GROUND as illustrated.
3. Turn TEST SELECTOR to the POINT RES. position.
4. START engine and operate at IDLE speed.
5. METER should read in the engine RUNNING--GOOD band. Variations within the GOOD band are allowable.

   LOW and STEADY readings usually indicate excessive resistance due to loose connections, defective leads, poor grounding etc..

   LOW and UNSTEADY readings usually indicate abnormal point resistance.

   Perform ENGINE STOPPED tests for isolating abnormal resistance.

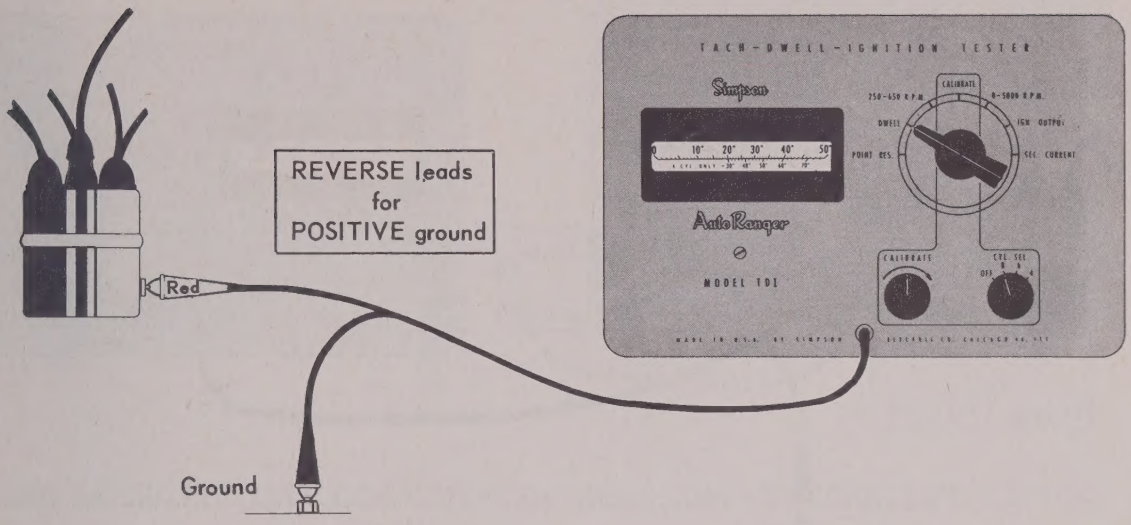
POINT RESISTANCE (ENGINE STOPPED)

1. Connect test leads as illustrated and turn IGNITION switch ON.
2. With the TEST SELECTOR in the POINT RES. position, the meter should read in the engine STOPPED--GOOD band. If meter reads in the BAD band, BUMP engine with starter until highest reading is obtained.
3. To ISOLATE abnormal resistance, REMOVE distributor CAP and ROTOR.
4. TEST each portion of the circuit and observe the meter for a noticeable change between check points. The abnormal resistance is located between the points of the last high reading and the first low reading.

   Progressively move the ground lead closer to the primary terminal as follows: from engine ground to distributor housing; from distributor housing to breaker plate; from breaker plate to support contact; from support contact to movable contact etc..

5. AFTER TESTS,—Turn tester switches to the OFF & CALIBRATE positions.

DWELL AND DWELL VARIATION TESTS



DWELL TEST (POINT SPACING)

1. ZERO meter and CALIBRATE tester as outlined on page 3.
2. Connect test leads to DISTRIBUTOR primary terminal and GROUND as illustrated.
3. Turn TEST SELECTOR to the DWELL position.
4. START engine and operate at IDLE speed.
5. Observe meter reading. On four cylinder engines use the 30–70 degree scale. Refer to Manufactures Specification for recommended dwell.

DWELL VARIATION TEST (DISTRIBUTOR WEAR)

1. Slowly increase and decrease engine speed from idle to approximately 1500–2000 rpm. for VARIATIONS.

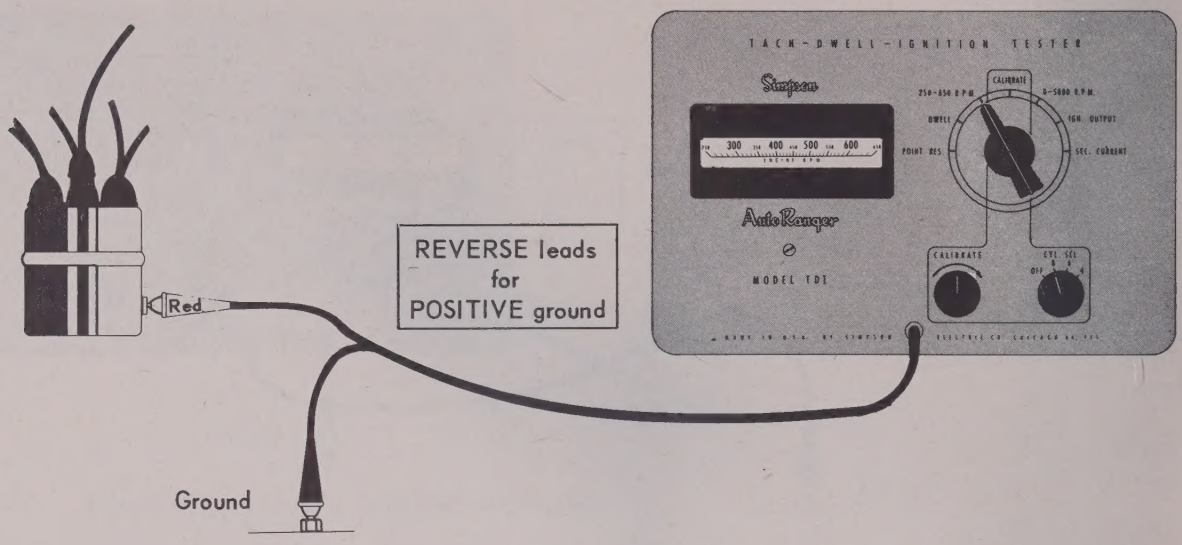
   If the dwell reading varies more than THREE degrees abnormal wear of the distributor shaft, bushings or breaker-plate is indicated. On AUTO–LITE distributors having Side-Pivoted breaker-plates, allow FIVE degrees variation unless otherwise specified.

2. AFTER TESTS – Turn tester switches to the OFF & CALIBRATE positions.

DWELL ADJUSTMENT (CRANKING ENGINE)

1. Connect test leads and calibrate tester the same as for Dwell Tests above.
2. REMOVE the distributor CAP and ROTOR. Disconnect the coil SECONDARY wire from the center tower of CAP and reconnect to GROUND.
3. With Ignition switch ON--CRANK engine and adjust ignition points until correct dwell is obtained.

ENGINE SPEED AND CARBURETOR IDLE MIXTURE ADJUSTMENT



ENGINE SPEED

1. ZERO meter and CALIBRATE tester as outlined on page 3.
2. Connect test leads to DISTRIBUTOR primary terminal and GROUND as illustrated and START engine.
3. Turn TEST SELECTOR to: 250–650 RPM position for LOW engine speeds.
   0–5000 RPM position for HIGH engine speeds.

   NOTE: 1500 RPM is a common test speed and is shaded in RED for easier reading.

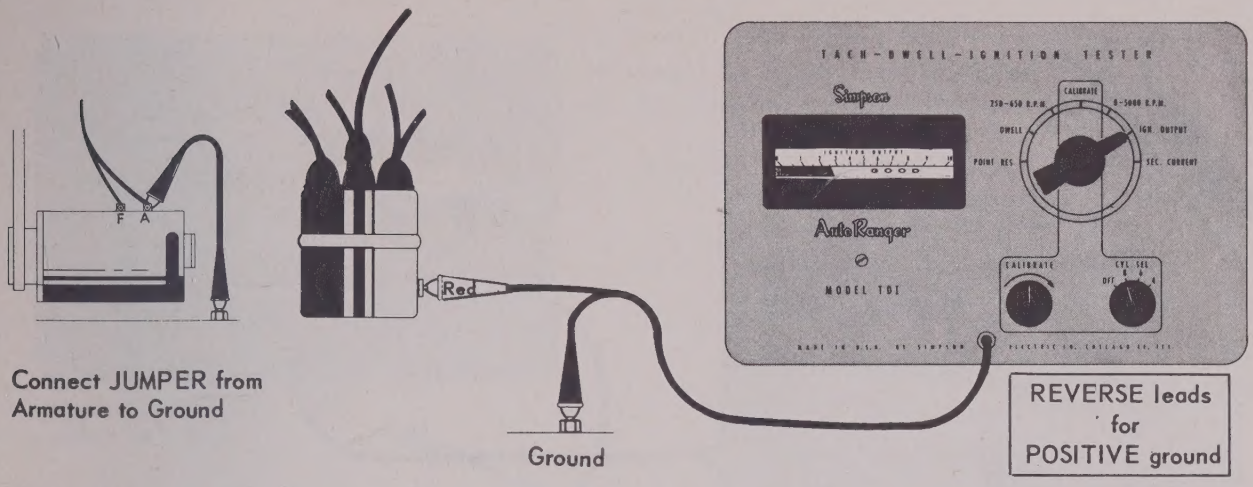
CARBURETOR IDLE SPEED AND MIXTURE ADJUSTMENT

IMPORTANT: The engine should be at NORMAL operating temperature and the air cleaner ON. Refer to Manufactures Specifications for special procedures.

1. SET BRAKE and place SHIFT SELECTOR in recommended position.
2. Turn TEST SELECTOR to 250–650 RPM position.
3. Adjust IDLE SPEED SCREW (or AIR SCREW) to specified IDLE speed.
4. Turn IDLE MIXTURE screw IN (Leaner) until a DROP in RPM is noted.

   Turn IDLE MIXTURE screw OUT (Richer) until the highest and most steady RPM is obtained. The mixture should be as rich as possible without sacrificing RPM or smoothness of operation to prevent stalling when the engine is cold.
5. On carburetors having TWO mixture screws, REPEAT step No. 4 with the other mixture screw.
6. If engine speed has INCREASED above the specified IDLE SPEED after adjustment of the mixture screws, REPEAT steps 3, 4, & 5.
7. AFTER TESTS – Turn tester switches to the OFF & CALIBRATE positions.

IGNITION OUTPUT AND MISS TESTS



IGNITION OUTPUT TEST (COIL CONDITION AND SECONDARY CIRCUIT INSULATION)

1. With the engine STOPPED, connect a JUMPER lead from the ARMATURE terminal of the generator to GROUND as illustrated.
   NOTE: Killing the generator output provides a stabilized battery voltage for ignition tests.
2. ZERO meter and CALIBRATE tester as outlined on page 3.
3. Connect test leads to DISTRIBUTOR primary terminal and GROUND as illustrated.
4. START engine, turn TEST SELECTOR to the 5000 RPM position and adjust engine speed to 1500 rpm (division outlined in RED for easy viewing).
5. Turn TEST SELECTOR to the IGN. OUTPUT position.
6. Using INSULATED pliers, remove any SPARK PLUG WIRE from a plug. If the coil is good and there is no insulation leakage, the meter will read in the GOOD band. Reconnect the wire to the spark plug.
   INSULATION tests of the remaining circuits including wires and all portions of the distributor cap may be tested by repeating step number 6 for each spark plug wire.
   The Ignition Output test must indicate GOOD for detecting Ignition Miss in the following tests.

IGNITION MISS TEST (ACCELERATION METHOD)

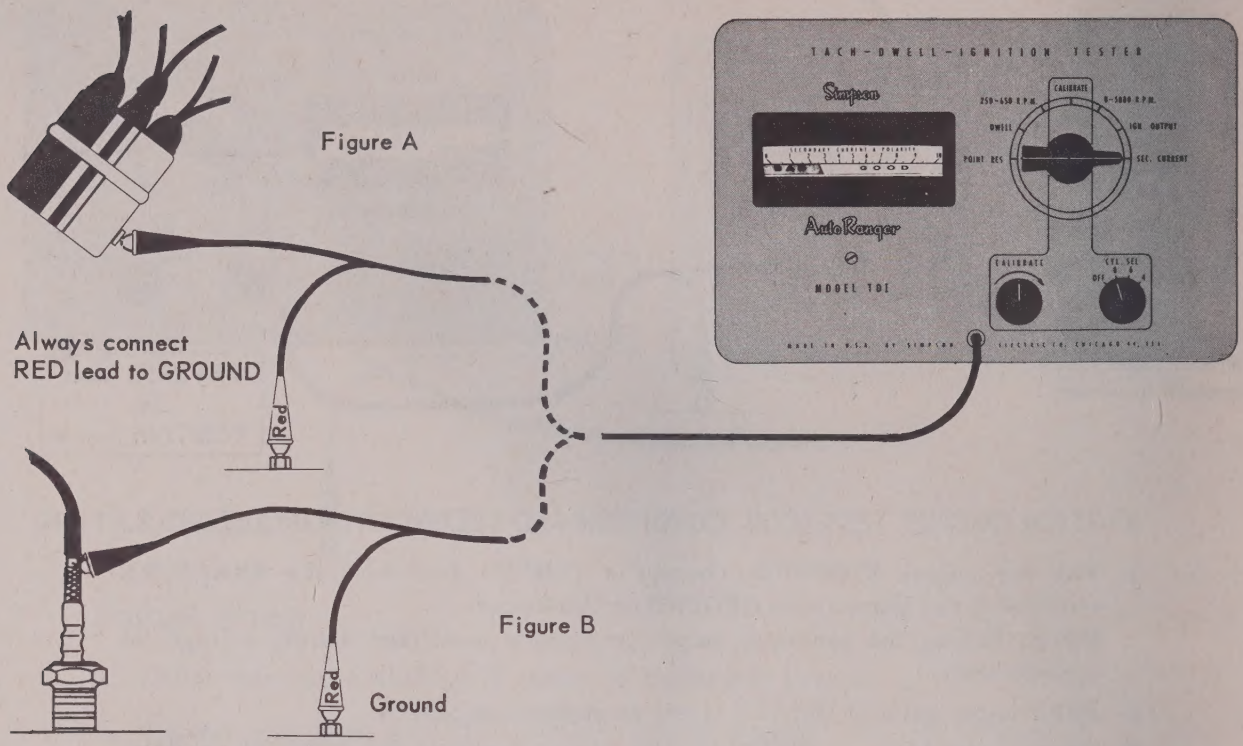
1. Operate engine at IDLE speed.
2. With the TEST SELECTOR in the IGN. OUTPUT position, ACCELERATE and DECELERATE the engine QUICKLY while observing the meter. The meter pointer should remain at ZERO.*
   NOTE: On some ignition systems a slight deflection, but less than a meter reading of ONE (1) is normal.
3. AFTER TESTS – Turn tester switches to the OFF & CALIBRATE positions. Remove JUMPER lead from the generator.

IGNITION MISS TEST (ROAD TEST METHOD)

1. Follow the same procedure as outlined for the Acceleration Method above.*

*NOTE - If the engine misses, but this is not indicated on the meter, this generally identifies plug fouling.

SECONDARY CURRENT AND POLARITY TESTS



SECONDARY CURRENT (RESISTANCE OR MILLIAMPERES) AND POLARITY TESTS

1. ZERO meter and CALIBRATE tester as outlined on page 3.
2. Install spark plug ADAPTOR on ONE (most accessible) spark plug. Place adaptors on all plugs if resistance of all wires and connections is to be tested.
3. Connect test leads to DISTRIBUTOR primary terminal and GROUND as illustrated in Figure A above.
4. START engine, turn TEST SELECTOR to 5000 RPM position, and adjust engine speed to 1500 rpm. (Division is outlined in RED for easy viewing.)
5. Disconnect test leads and turn test selector to SECONDARY CURRENT position.
6. Reconnect the RED test lead to ground and touch the clip of the BLACK test lead to the spark plug terminal or adaptor as illustrated in Figure B above. Meter should read in the GOOD band.

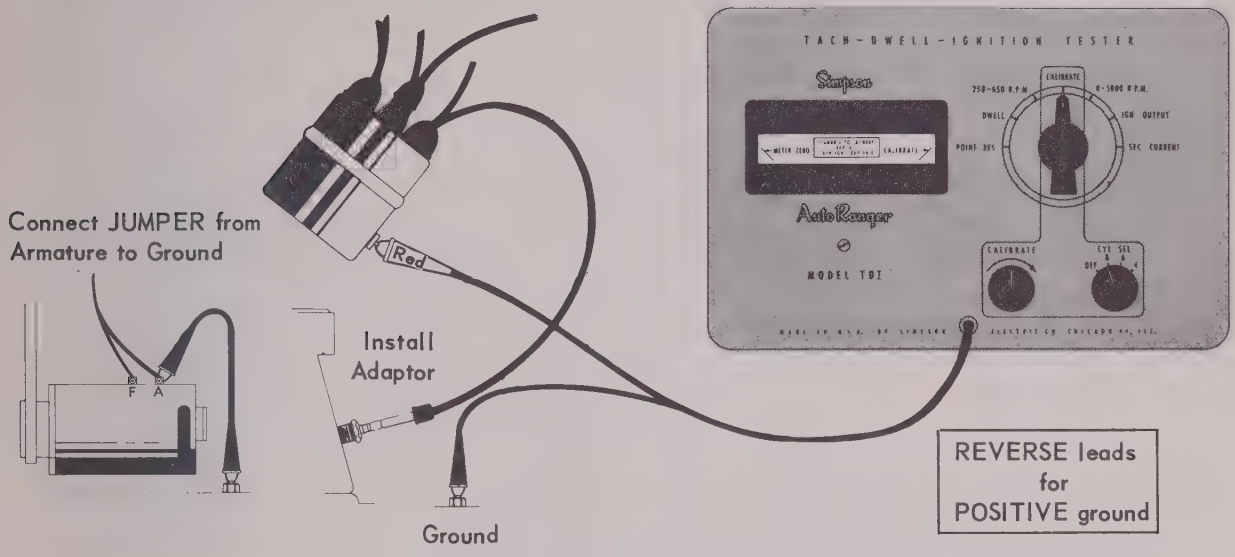
   POLARITY INDICATION – If the meter reads off scale to the left with the RED test lead connected to ground, coil polarity is reversed.*

   CURRENT TEST – If all plug wires are tested, meter should read in the GOOD band and not vary more than ONE division between plugs.*
7. After test, turn tester switches to the OFF and CALIBRATE positions. Remove spark plug adaptors.

* See page 13 for test indications.

PROCEDURE FOR SERIES OF "SHORT-CUT" TESTS

The following procedure is recommended for a complete series of short-cut (area) tests to obtain a maximum of information on the condition of the ignition system in a minimum of time.



PREPARATION FOR TESTS

1. Turn TEST SELECTOR to the CALIBRATE position.
2. Adjust ZERO CORRECTOR right or left until the meter pointer is in the METER ZERO line.
3. Connect test leads to DISTRIBUTOR primary terminal and GROUND as illustrated.
4. Connect a JUMPER lead from the ARMATURE terminal of the generator to GROUND as illustrated.
5. Install spark plug ADAPTOR on ONE (most accessible) spark plug. Place adaptors on all plugs if resistance of all wires and connections is to be tested.
6. Turn CYLINDER SELECTOR switch to proper position (8 for 8 cylinder engines etc.).
7. Adjust CALIBRATE CONTROL to the right or left until the meter pointer is on the CALIBRATE LINE. If unable to adjust meter to the calibrate line, REPLACE batteries, see page 3.
8. SET BRAKE and place SHIFT selector in NEUTRAL or PARK position.
9. START engine and operate at IDLE speed.

POINT RESISTANCE TEST (ENGINE RUNNING)

10. Turn TEST SELECTOR to the POINT RES. position.
11. METER should read in the GOOD band. Variations within the GOOD band are allowable. To ISOLATE abnormal resistance refer to page 4.

PROCEDURE FOR SERIES OF "SHORT-CUT" TESTS (Cont'd)

DWELL TEST (POINT SPACING)

12. Turn TEST SELECTOR to the DWELL position.

13. OBSERVE meter reading. On four cylinder engines use the 30–70 degree scale. Refer to manufactures specifications for recommended dwell setting.

DWELL VARIATION TEST (DISTRIBUTOR WEAR)

14. Slowly increase and decrease engine speed from idle to approximately 1500–2000 rpm while observing meter for VARIATIONS.

    If the dwell reading varies more than THREE degrees, abnormal wear of the distributor shaft, bushings or breaker-plate is indicated. On Auto-Lite distributors having SIDE–PIVOTED breaker-plates, allow FIVE degrees variation unless otherwise specified.

IDLE SPEED

15. Operate engine at IDLE speed.

16. Place SHIFT SELECTOR in recommended position.

17. Turn TEST SELECTOR to the 250–650 RPM position.

18. The meter should read STEADY and within the specified IDLE SPEED range.

    BEFORE CONTINUING WITH TESTS PLACE SHIFT SELECTOR IN NEUTRAL.

IGNITION MISS TEST (NO-LOAD ACCELERATION)

19. Turn TEST SELECTOR to the IGN. OUTPUT position.

20. ACCELERATE and DECELERATE the engine QUICKLY while observing the meter. The meter pointer should remain at ZERO.

    NOTE: On some ignition systems a slight deflection but less than a meter deflection of ONE (1) is NORMAL.

IGNITION OUTPUT TEST (COIL CONDITION AND SECONDARY CIRCUIT INSULATION)

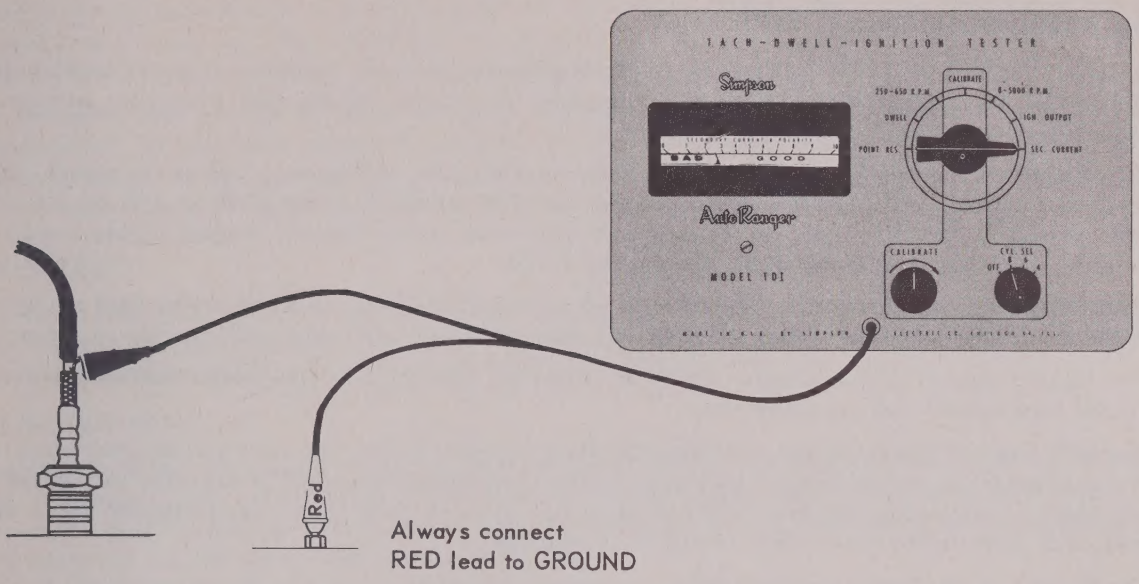
21. Turn TEST SELECTOR to the 5000RPM position and ADJUST engine speed to 1500 rpm. (Division is outlined in RED for easy viewing.)

22. Turn TEST SELECTOR to the IGN. OUTPUT position.

23. Using INSULATED pliers, remove any spark plug WIRE from a plug. If the coil is good and there is no insulation leakage, the meter will read in the GOOD band. Reconnect the wire to the spark plug.

    INSULATION test of the remaining circuits including wires and all portions of the distributor cap may be tested by repeating step 23 for each spark plug wire.

PROCEDURE FOR SERIES OF "SHORT-CUT" TESTS (Cont'd)



If the Output test indicates an unsatisfactory condition, REPEAT the Ignition Miss and Output tests after repair service has been performed.

24. Leave engine speed at 1500 RPM.

25. Turn TEST SELECTOR to the SEC. CURRENT position.

26. Connect the RED test lead to GROUND and touch the clip of the BLACK lead to a spark plug TERMINAL or ADAPTOR as illustrated. Meter should read in the GOOD band. If the meter reads OFF–SCALE to the LEFT, coil polarity is reversed.

27. If ALL WIRES are tested, METER should read in the GOOD band and not vary more than ONE division between plugs.

AFTER TESTS

28. ADJUST engine speed to the recommended IDLE speed. Turn tester switches to the OFF & CALIBRATE positions. Remove JUMPER lead and spark plug ADAPTORS.

EXPLANATION OF TESTS

POINT RESISTANCE (DYNAMIC AND STATIC)

Abnormal resistance of the ignition points is undoubtedly the most frequent cause for ignition distributor failure. Excessive point resistance causes hard-starting, rough idle, acceleration miss, poor mileage, loss of power and missing at high speed.

Contact point resistance is usually determined by measuring the voltage drop across the points with normal ignition current flowing. With the engine stopped the allowable voltage-drop through the distributor circuit usually should not exceed 0.15 volt. This may be measured with a low scale voltmeter or other voltage sensitive tester such as the Point Resistance test of the Simpson Model TDI.

When performing the static tests it is recommended to "bump" the engine with the starter until the best reading is obtained. However, the best reading is not always a true indication of their actual operating condition.

The ideal method of analyzing point operation is to test them under an operating condition and determine if they make good contact each time they close.

The NEW Simpson Dynamic Point Test measures the resistance of the contacts each time they close while the engine is operating at various speeds. Each time the points close the resistance is measured and indicated on the meter. When the points open the measuring circuit is disconnected. If the points occassionally fail to make good contact, it is indicated by erratic and lowered meter readings.

The Dynamic Point Test is recommended as a "Quick" method of determining the overall condition of the distributor primary circuit during engine operation. The Static Tests are recommended for pin-pointing abnormal resistance by tracing across each part of the circuit, using a step-by-step procedure.

DWELL

Dwell or cam angle is the number of degrees of breaker cam rotation measured from the time the ignition points close until they re-open.

Dwell and gap have a direct relationship. Increasing point gap decreases dwell angle, and decreasing point gap increases dwell angle. Both dwell and gap should be within specified limits for maximum performance and point life.

If unable to obtain the specified gap with the correct dwell or vice-versa, trouble in the distributor is indicated. The difficulty could be worn distributor cam, defective points, wrong points or bent shaft.

If the manufacturer specifies that the dwell should range from a recommended low to high limit, use the low limit specification when adjusting or installing new points. Normal wear of the rubbing block will tend to increase the dwell towards the high limit.

DWELL VARIATION

The purpose of the dwell variation test is to determine the mechanical condition of the distributor under an operating condition. Increasing and decreasing engine speed from idle to approximately 2000 rpm (no-load) applies thrust to the distributor shaft and allows for maximum rotation of the vacuum advance plate. Abnormal dwell variation indicates excessive wear of the distributor shaft, bushings and/or breaker plate bearing.

The vacuum line may be disconnected and the test repeated to determine if the wear is in the breaker plate assembly.

Dwell change directly influences ignition timing. For example; if the dwell increases four degrees, ignition timing is retarded four degrees. Late timing results in loss of power and poor performance. Unless the distributor is specifically designed for a predetermined amount of dwell change, the dwell reading should remain constant. Abnormal variations will affect the performance of the engine.

CARBURETOR ADJUSTMENT

Basically the vacuum gauge functions like a tachometer during carburetor idle mixture adjustments. At a given throttle setting any variation in engine speed directly influences manifold vacuum. A slight variation in engine speed causes a more noticeable deflection on a vacuum gauge than it does on a conventional low scale tachometer. The SENSIVIVITY of the Simpson EXPANDED scale tachometer magnifies changes in engine speed that are not readily indicated by a vacuum gauge. On today's engines, the average vacuum is lower and more unsteady. These two factors now make it more difficult to obtain the correct carburetor adjustment, using the best types of vacuum gauges.

The Simpson EXPANDED scale tachometer was primarily designed for simplifying precision carburetor adjustments. This new 250-650 rpm scale tachometer has more than twice the SENSITIVITY of conventional testers. It is dampened so normal variations in engine speed will not cause false interpretations. One electrical connection makes it simple and fast to use. The EXPANDED scale tachometer has the ACCURACY, SENSITIVITY and the READABILITY which is so essential for precision adjustments on carburetors used on today's engines.

During carburetor idle adjustment, momentarily accelerate the engine to clear the carburetor and manifold. During acceleration, the Low-Scale tachometer will read Off-Scale to the right. All Simpson meters are protected for momentary overloads of 10 times the maximum scale reading. Therefore, during carburetor adjustment it is not essential to change tachometer scales when accelerating the engine since it will not harm the meter.

HIGH SPEED TESTS

The popular 0-5000 RPM scale was selected as the best general purpose range for application on the various automotive engines. Several tests are performed at the 1500 rpm division, as outlined in RED. The red outline provides a test speed tolerance of 1450-1550 rpm to simplify speed adjustment.

IGNITION OUTPUT TEST

The ignition output test is primarily an area or short-cut test of various components of the ignition system such as the coil, condenser, rotor, cap and wires. The test has a two-fold purpose; first to determine the ability of the ignition system to produce ignition voltage with a predetermined primary input, and second to test the insulation of the coil, rotor, cap and wires with adequate stress voltage.

The armature terminal of the generator is grounded to provide a stabilized battery voltage for the test.

With the engine operating at 1500 rpm and the test selector in the IGN. OUTPUT position, the meter should read ZERO when all plugs are firing.

Using an insulated pliers, remove any one spark plug wire from the plug and suspend it until no arc occurs. If the ignition system produces adequate voltage and there is no insulation leakage, the meter will read steady in the GOOD band. A meter reading in the BAD band indicates a defective coil, or insulation leakage of the rotor, cap, or secondary wires.

IGNITION MISS TEST

With all plugs firing, the meter should read ZERO in the IGN. OUTPUT test. Any "Up-Scale" reading of the meter indicates ignition miss caused by failure of current to flow in the secondary.

To LOAD test the ignition system, the engine is momentarily accelerated from idle to wide open throttle. This simulates a condition of near maximum ignition requirements. Any deflection of ONE division or more during acceleration indicates failure of current to flow in the secondary circuit.

If a miss is indicated, the trouble could be excessive spark plug gap, rounded plug electrodes, open secondary wires or suppressors, excessive rotor gap, or corrosion in towers and terminals.

SECONDARY CURRENT (RESISTANCE) AND POLARITY TESTS

The purpose of this test is to locate abnormal resistance in the secondary circuit of the ignition system. Causes for excessive resistance are; broken secondary wires, defective suppressors, loose or corroded terminals, excessive rotor gap, etc.

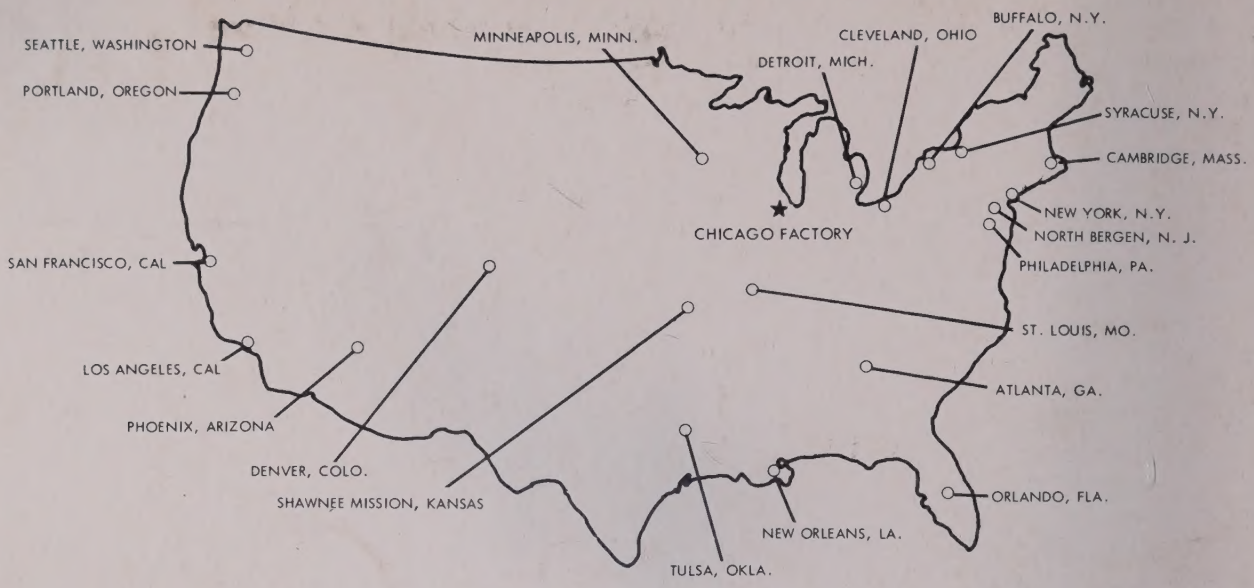
At 1500 engine rpm the readings at all plugs should be in the GOOD band. Uneven readings are normal on ignition systems using suppressor wires, however the lowest reading should be in the GOOD range. On ignition systems using conventional secondary wires, the readings should be in the GOOD range and not vary more than ONE division. If the meter reads in the BAD range or there are excessive variations, abnormal resistance is indicated.

Isolation of abnormal secondary resistance may be accomplished by using a high range ohmmeter such as the Secondary Resistance Test of the Model CCM Condenser-Coil-Magneto Tester.

Correct secondary polarity is indicated by an up-scale meter reading with the red test lead connected to ground and the black lead to the spark plug. The polarity of the center electrode of the spark plug should be negative. If the polarity is reversed, a much higher voltage is required to push an arc across the spark plug gap. Reverse polarity can cause ignition failure when all other components are satisfactory.

Causes for reversed polarity are; incorrect coil connections (externally or internally), wrong coil, and battery installed backwards or charged in reverse.

SIMPSON AUTHORIZED REPAIR STATIONS



ARIZONA, PHOENIX
Metercraft, Inc., 3304 N. 24th St.
Phone: CRestwood 9-5287

CALIFORNIA, LOS ANGELES
Quality Electric Co., 3700 S. Broadway
Phone: ADams 2-4201

CALIFORNIA, SAN FRANCISCO
Pacific Electrical Instrument Lab.
111 Main St., Phone: GArfield 1-7185

COLORADO, DENVER
Meter Master Instrument Service
2379 S. Downing St., Phone: RAce 2-8670

FLORIDA, ORLANDO
Electro-Tech, Inc., 307 – 27th Street
Phone: GArden 3-5589

GEORGIA, ATLANTA
Electro-Tech Equipment, 690 Murphy Ave.
Phone: PLaza 3-4128

KANSAS, SHAWNEE MISSION
Sturtz Instrument Co., 4705 Mission Road
Phone: SKyline 1-4711

LOUISIANA, NEW ORLEANS
Industrial Instrument Works, 3328 Magazine St.
Phone: TWinbrook 5-5621

MASSACHUSETTS, CAMBRIDGE
Alvin C. Mancib Co., 363 Walden Street
Phone: UNiversity 4-2494

MICHIGAN, DETROIT
Ram Meter, Inc., 1100 Hilton Rd., Ferndale
Phone: LIncoln 7-1000

MINNESOTA, MINNEAPOLIS
Instrumentation Services, 917 Plymouth Ave.
Phone: KEllogg 7-5411

MISSOURI, ST. LOUIS
Scherrer Instruments, 5449 Delmar Blvd.
Phone: FOrest 7-9800

NEW JERSEY, NORTH BERGEN
Automotive Testing Equipment Co.
2106 Tonnelle Ave., Phone: UNion 4-0345

NEW YORK, BUFFALO
Electrical Instruments Labs.
1487 Hertel Avenue
Phone: EXport 2-2726

NEW YORK, NEW YORK
Simpson Instrument Service Corp.
27 Park Place, Phone: BArclay 7-4977

NEW YORK, SYRACUSE
Syracuse Instrument Lab., 4895 South Ave.
Phone: HYatt 2-1651

OHIO, CLEVELAND
Weschler Electric Co., 4250 W. 130th St.
Phone: CLearwater 1-4609

OKLAHOMA, TULSA
Tri-State Instrument Lab., 2216 N. Sheridan Rd.
Phone: TEmple 5-1890

OREGON, PORTLAND
The Instrument Laboratory, 1316 S.E. 7th Ave.
Phone: BElmont 4-6683

PENNSYLVANIA, PHILADELPHIA
Sunshine Scientific Instrument
1810 Grant Ave., Phone: ORchard 3-5600

WASHINGTON, SEATTLE
The Instrument Laboratory, Inc.
934 Elliott Avenue, West
Phone: ATwater 3-5850

SIMPSON ELECTRIC COMPANY (Factory), 5200 W. KINZIE STREET, CHICAGO 44, ILLINOIS

ONE YEAR WARRANTY

SIMPSON ELECTRIC COMPANY warrants each instrument and other articles of equipment manufactured by it to be free from defects in material and workmanship under normal use and service, its obligation under this warranty being limited to making good at its factory any instrument or other article of equipment which shall within one year after delivery of such instrument or other article of equipment to the original purchaser be returned intact to it, or to one of its authorized service stations, with transportation charges prepaid, and which its examination shall disclose to its satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied and of all other obligations or liabilities on its part, and SIMPSON ELECTRIC COMPANY neither assumes nor authorizes any other persons to assume for it any other liability in connection with sale of its products.

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